SUPREME COURT, U. S.

Supreme Court, U.S.
FILED
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E. ROBERT SEAVER, CLERK

IN THE

Supreme Court of the United States

OCTOBER TERM, 1970

No. 705

CHEMTRONICS, INC. AND J. RYAN NEVILLE,
Petitioners,

v.

BECKMAN INSTRUMENTS, INC. AND LELAND C. CLARK, JR.,
Respondents.

APPENDIX TO PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FIFTH CIRCUIT

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September 17, 1970

FIDELITY PRINTING COMPANY, INC., HOUSTON

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
SAN ANTONIO DIVISION

BECKMAN INSTRUMENTS, INC., and LELAND C. CLARK, JR.,	)
Plaintiffs,	)
v.	) Civil Action
CHEMTRONICS, INC., and J. RYAN NEVILLE,	) No. 3633
Defendants.	)

FINDINGS OF FACT AND CONCLUSIONS OF LAW

1. This is a patent infringement suit arising under the Patent Laws of the United States, and this Court has jurisdiction over the parties and the subject matter of this civil action.

2. The patent in suit was granted to plaintiff Leland C. Clark, Jr., on November 17, 1959 upon an application Ser. No. 573,023 filed March 21, 1956.

3. Plaintiff Clark entered into an agreement on October 23, 1956 under the terms of which plaintiff Beckman Instruments, Inc. was granted an exclusive license under the patent in suit as well as the right to grant sub-licenses to others. Beckman has granted sub-licenses to seventeen companies.

4. Dr. Clark received the degree of Doctor of Philosophy from the University of Rochester in Rochester, New York, in 1944 and then went to Antioch College in Yellow Springs, Ohio, to take charge of a

biochemistry program at the Fels Research Institute, where he became Director of the Biochemistry Laboratory. The program pertained particularly to the chemistry of child development and involved setting up a laboratory to do blood, urine and vitamin determinations, etc. In the course of time he became vitally interested in the development of a large number of projects.

5. In many of these projects the oxygen content of a substance was of interest, both scientifically and clinically. During the period between about 1949 and 1956, preceding his making of the invention in suit, he had experimented with various known techniques for the measurement of oxygen in fluids, but found that none of them was satisfactory. Consequently he began to work to devise an instrument which would function satisfactorily to measure blood oxygen, or "oxygen tension". His work centered about a polarographic devise, an electrochemical cell comprising a cathode, an anode, and an electrolyte connecting the two. If a carefully selected voltage is applied across the electrodes, the cathode becomes polarized. That is to say, its surface becomes covered with what may be visualized as a layer of electrons, and no current flows. If the cathode is now exposed to a medium containing oxygen, oxygen molecules reach the cathode and each molecule removes four electrons. Then there is a chemical reaction as the result of which water is formed, and the oxygen, as such, is consumed. As the result of the removal of electrons from the cathode by the oxygen molecules, the cathode becomes depolarized and current flows. The rate at which the electrons are removed from the cathode is directly dependent upon the number of oxygen molecules in the medium.

being measured and the rate at which they reach the cathode. Consequently the magnitude of the current is a measure of the amount of oxygen in the medium to be measured.

6. While the essential process seems rather simple, in practice there were very difficult problems. Perhaps the most difficult problem arises from the fact that if the cathode is dipped in a liquid such as blood, it rapidly becomes "poisoned" by the accumulation of various substances on its surface which block and eventually stop the polarographic activity. Moreover, a bare cathode dipped in a liquid is extremely sensitive to any motion of the liquid with respect to the cathode, and the motion (which is almost inevitable), introduces a large error in the measurement.

7. In an attempt to overcome these difficulties, Dr. Clark tried many schemes with various degrees of success, including in particular the use of implanted electrodes, both bare and cellophane covered, which proved useful for measuring oxygen changes in animal brain tissue, and the use of a cellophane covered cathode (negative electrode) which proved useful in measuring blood oxygen in the operation of the heart-lung machine.

8. On October 4, 1954 Dr. Clark was sitting on a bench while on a visit to Columbus and it occurred to him that the measurement of oxygen could be much better made if he put <u>both</u> the anode and the cathode behind a membrane which was not permeable to ions but which would permit the passage of oxygen. He rushed home to his laboratory and constructed a completely successful polarographic devise for measuring oxygen,